INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6:

G06K 09/20

A3

(11) International Publication Number:

WO 96/31047

3 October 1996 (03.10.96)

(43) International Publication Date:

US

US

(21) International Application Number:

PCT/US96/04400

(22) International Filing Date:

29 March 1996 (29.03.96)

(30) Priority Data:

08/414,437 08/554,848

31 March 1995 (31.03.95)

7 November 1995 (07.11.95)

(71) Applicant (for all designated States except US): REGENTS OF THE UNIVERSITY OF CALIFORNIA [US/US]; 22nd floor, 300 Lakeside Drive, Oakland, CA 94612-3550 (US).

(72) Inventors; and

- (75) Inventors/Applicants (for US only): JAIN, Ramesh [US/US]; 4715 Reedly Terrace, La Jolia, CA 92130 (US). WAKI-MOTO, Koji [JP/US]; 6-36-8-204, Shonandai, Fujisawa, Kanagawa 252 (JP). MOEZZI, Saied [US/US]; 10420 Caminito Alvarez, San Diego, CA 92126 (US). KATKERE, Arun [IN/US]; 9500 Gilman Drive, La Jolla, CA 92093-0407 (US).
- (74) Agent: FUESS, William, C.; Suite II-G, 10951 Sorrento Valley Road, San Diego, CA 92121-1613 (US).

(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, ČA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM,

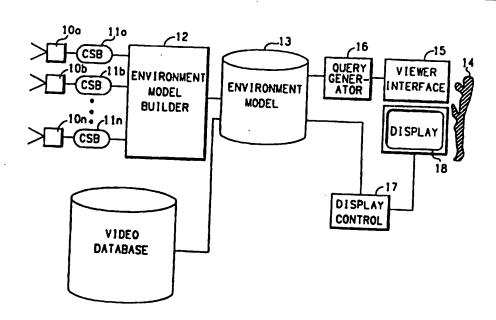
GA, GN, ML, MR, NE, SN, TD, TG).

Published

With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(88) Date of publication of the international search report: 7 November 1996 (07.11.96)

(54) Title: IMMERSIVE VIDEO



(57) Abstract

Immersive video, or television, images of a real-world scene are synthesized (i) on demand, (ii) in real time, (iii) as linked to any of a particular perspective on the scene, or an object or event in the scene, (iv) in accordance with usercified parameters of presentation, including panoramic or magnified presentations, and/or (v) stereoscopically. Multiple eo cameras (10a-10c) each at a different spatial location produce multiple two-dimensional video images of the scene. A viewer/user specifies viewing criterion (ia) at a viewer interface (10). A video display (18) receives and displays the

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

| AM | Annenia | GB | United Kingdom | MW | Malawi |
|----|--------------------------|----|------------------------------|----|--------------------------|
| AT | Austria | GE | Georgia | MX | Mexico |
| AU | Australia | GN | Guinea | NE | Niger |
| BB | Barbados | GR | Greece | NL | Netherlands |
| BE | Belgium | HU | Hungary | NO | Norway |
| BF | Burkina Faso | IE | Ireland | NZ | New Zealand |
| BG | Bulgaria | IT | Italy | PL | Poland |
| BJ | Benin | JP | Japan | PT | Portugal |
| BR | Brazil | KE | Kenya | RO | Romania |
| BY | Belarus | KG | Kyrgystan | RU | Russian Federation |
| CA | Canada | KP | Democratic People's Republic | SD | Sudan |
| CF | Central African Republic | | of Korea | SE | Sweden |
| CG | Congo | KR | Republic of Korea | SG | Singapore |
| CH | Switzerland | KZ | Kazakhstan | SI | Slovenia |
| CI | Côte d'Ivoire | Ц | Liechtenstein | SK | Slovakia |
| CM | Cameroon | LK | Sri Lanka | SN | Senegal |
| CN | China | LR | Liberia | SZ | Swaziland |
| CS | Czechoslovakia | LT | Lithuania | TD | Chad |
| CZ | Czech Republic | LU | Luxembourg | TG | Togo |
| DE | Germany | LV | Larvia | TJ | Tajikistan |
| DK | Denmark | MC | Monaco | TT | Trinidad and Tobago |
| RE | Estonia | MD | Republic of Moldova | UA | Ukraine |
| ES | Spain | MG | Madagascar | UG | Uganda |
| FI | Finland | ML | Mali | US | United States of America |
| FR | Prance | MN | Mongolia | UZ | Uzbekistan |
| GA | Gabon | MR | Mauritania | VN | Viet Nam |

INTERNATIONAL SEARCH REPORT

International application No. PCT/US96/04400

| A. CLASSIFICATION OF SUBJECT MATTER IPC(6) :G06K 09/20 US CL :364/514A According to International Patent Classification (IPC) or to both national classification and IPC | | | | | | | |
|---|---|--|--|--|--|--|--|
| B. FIELDS SEARCHED | | | | | | | |
| Minimum documentation searched (classification system followed by classification symbols) | | | | | | | |
| U.S. : 364/514A; 382/10, 16, 19, 23, 28; 395/119, 120, 125, 127; 359/462, 466 | | | | | | | |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched | | | | | | | |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) | | | | | | | |
| APS (real-world scene; and model; and multiple cameras; and three-dimensional; and viewer criterion; and synthesizing; and spatial perspective) | | | | | | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | | | | | | |
| Category* Citation of document, with indication, where ap | propriate, of the relevant passages Relevant to claim No. | | | | | | |
| X US, A, 5,267,329 (ULICH ET AL) 9, lines 21-24, col. 7, lines 58-68, lines 35-37, col. 8, lines 10-14, col. | col. 8, lines 65-67, col. 8, | | | | | | |
| Further documents are listed in the continuation of Box C Special categories of cited documents: 'A' document defining the general state of the art which is not considered to be part of particular relevance | See patent family annex. The later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention | | | | | | |
| "E" carlier document published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be | | | | | | |
| 'O' document referring to an oral disclosure, use, exhibition or other means | considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art | | | | | | |
| *P* document published prior to the international filing date but later than the priority date claimed | *&* document member of the same patent family | | | | | | |
| Date of the actual completion of the international search 24 JUNE 1996 | Date of mailing of the international search report 16 SEP 1996 | | | | | | |
| Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230 | Authorized officer Manuel Todd Voeltz Telephone No. (703) 305-9784 | | | | | | |